APPENDIX B

LAND RETIREMENT EVALUATION

TABLE OF CONTENTS

Tables

B1 DESCRIPTION

This section describes how land retirement is being addressed in the San Luis Drainage Feature Re-evaluation. Land retirement is defined as *the removal of lands from irrigated agricultural production by purchase or lease for other purposes or land uses*. In short, agricultural land is retired from production with an assumption that irrigation activities will cease and drainage would not be produced such that these lands would not require drainage service. Land retirement affects the number of acres requiring drainage service, and hence the volume, and potentially the aggregate quality of the drainwater produced.

Reclamation has determined that drainage management alternatives that include a land retirement component for the purpose of reducing drainwater volumes will not be included in the San Luis Drainage Feature Re-evaluation analysis of action alternatives because land retirement does not meet the project purpose court order to provide drainage service to the Unit (Section 1.3). Consequently, land retirement is not a component of drainwater reduction nor of any other feature in the action alternatives described in Section 5 (except for 10,006 acres permanently retired under the Central Valley Project Improvement Act program and the Britz settlement). However, lands may be removed from current agricultural production to accommodate potential project features such as reuse facilities or evaporation ponds.

Due to interest in land retirement scenarios, Reclamation evaluated three possible levels of land retirement to determine how it would affect the facilities and costs for providing drainage service. Reclamation did not evaluate these land retirement scenarios as alternatives for providing drainage service; rather, Reclamation estimated the reduced quantity of drainwater that would result from these three levels of land retirement and the resulting cost reductions for drainage service facilities. The three land retirement scenarios evaluated are:

- The first scenario involves retirement of 40,000 acres of land consistent with the 1990 Rainbow Report (SJVDP 1990) and the 1991 San Luis Unit Drainage Report, which identified approximately 34,000–48,000 acres for retirement within Westlands.
- The second scenario involves retirement of 200,000 acres of land consistent with Westlands' proposed plan to retire land within the district.
- The third scenario eliminates all Federal drainage service for Westlands. One possible aspect of the Westlands land retirement proposal is that Westlands would relieve Reclamation of its obligation to provide drainage service to the district. Under this scenario, Reclamation assumed that drainage service would be provided for 81,000 acres in the Northerly Districts.

The "land retirement analysis" only assumes the retired lands will be put to a use that does not include significant application of water but does not make any assumptions regarding the following:

- The entity implementing the land retirement
- The entity that will be responsible for managing the retired lands
- How the water that would have otherwise been applied to the retired lands would be reallocated

B2 COST ESTIMATES FOR DRAINAGE SERVICE

The cost analysis includes an estimation of the remaining quality and quantity of subsurface drainwater still requiring service from the Unit (including lands in Westlands that still require drainage) and of the cost for the Federal portion of the drainage solution, including collection, conveyance, reuse, treatment, and disposal.

Present value of construction, operation maintenance and repair, and energy and annual equivalent costs for complete drainage service for each of the retirement scenarios were scaled from cost estimates for each of the disposal options presented in Section 5. Costs presented for each scenario include only the Federal components and are summarized in Table B-1. Costs for acquisition and management of retired lands are not included in the cost estimates. Under all of the land retirement scenarios, the assumed non-Federal costs were not included. Tables B-2 through B-5 present the assumptions used in scaling of the drainage service costs for each of the retirement scenarios.

As shown in Table B-1, present value drainage service costs for the In-Valley Disposal Alternative are the lowest of all the land retirement scenarios. In-Valley present value costs for the land retirement scenarios range from $186,000,000 for no service for Westlands to $739,000,000 for the 40,000-acre scenario. Present value costs for other discharge alternatives for the no drainage service to Westlands scenario range from $236,000,000 for the Delta-Chipps Island Alternative to $277,000,000 for the Ocean Disposal Alternative. Table B-1 also shows the comparative costs of each land retirement scenario with respect to the original project design. For example, Table B-1 shows that retiring 40,000 acres would reduce the Federal cost for the In-Valley Alternative by $40,000,000.

Table B-1
Federal Drainage Service Project Costs for
Different Land Retirement Scenarios

Present Value of Construction, OM&R, and Energy Costs (millions of 2002 dollars)				
	Federal Costs Only			
	Ocean	Chipps Island	Carquinez Strait	In-Valley
Original Configuration	1,013	836	909	779
40,000-Acre Reduction	1,004	780	834	739
Difference from Original	9	56	75	40
200,000-Acre Reduction	749	639	666	603
Difference from Original	264	197	243	176
No Service for Westlands	277	236	261	186
Difference from Original	736	600	648	593

Notes: Does not include costs for land acquisition or management of retired lands
Does not include costs for on-farm/in-district drainwater reduction actions

Table B-2
Assumptions Used to Determine Cost Differences for Land Retirement Scenarios, Ocean Disposal Alternative (2002 dollars)

Project Features	40,000 Acres Retired	200,000 Acres Retired	No Drainage Provided for Westlands
FEDERAL PROJECT COSTS			
Federal Costs – Alternative Specific			
Conveyance System	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $505,250,000 Annual OM&R Cost: $10,110,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $338,250,000 Annual OM&R Cost: $6,520,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $218,250,000 Annual OM&R Cost: $4,050,000
Evaporation Ponds	Not Applicable	Not Applicable	Not Applicable
Wetland Mitigation Facilities	Not Applicable	Not Applicable	Not Applicable
Reverse Osmosis Facilities	No change from original project design	No change from original project design	No change from original project design
Biological Selenium Treatment	Not Applicable	Not Applicable	Not Applicable
Common Federal Costs			
Drainage Collection System	95% of original design cost	90% of original design cost	Cost of Northerly Area Only
Regional Reuse Facilities	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area

OM&R: Operation, maintenance, and replacement costs, including energy costs.

Table B-3
Assumptions Used to Determine Cost Differences for Land Retirement Scenarios, Delta-Chipps Island Disposal Alternative (2002 dollars)

Project Features	40,000 Acres Retired	200,000 Acres Retired	No Drainage Provided for Westlands
FEDERAL PROJECT COSTS			
Federal Costs - Alternative Specific			
Conveyance System	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $213,000,000 Annual OM&R Cost: $1,950,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $180,000,000 Annual OM&R Cost: $1,430,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $159,000,000 Annual OM&R Cost: $1,040,000
Evaporation Ponds	Not Applicable	Not Applicable	Not Applicable
Wetland Mitigation Facilities	Not Applicable	Not Applicable	Not Applicable
Reverse Osmosis Facilities	No change from original project design	No change from original project design	No change from original project design
Biological Selenium Treatment	Re-estimated based on revised flow for this land retirement scenario (37 cfs)	Re-estimated based on revised flow for this land retirement scenario (22 cfs)	Re-estimated based on revised flow for this land retirement scenario (13 cfs)
Common Federal Costs			
Drainage Collection System	95% of original design cost	90% of original design cost	Cost of Northerly Area Only
Regional Reuse Facilities	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area

OM&R: Operation, maintenance, and replacement costs, including energy costs.

Table B-4
Assumptions Used to Determine Cost Differences for Land Retirement Scenarios, Delta-Carquinez Strait Disposal Alternative (2002 dollars)

Project Features	40,000 Acres Retired	200,000 Acres Retired	No Drainage Provided for Westlands
FEDERAL PROJECT COSTS			
Federal Costs - Alternative Specific			
Conveyance System	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $265,000,000 Annual OM&R Cost: $1,970,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $211,000,000 Annual OM&R Cost: $1,430,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $184,000,000 Annual OM&R Cost: $1,040,000
Evaporation Ponds	Not Applicable	Not Applicable	Not Applicable
Wetland Mitigation Facilities	Not Applicable	Not Applicable	Not Applicable
Reverse Osmosis Facilities	No change from original project design	No change from original project design	No change from original project design
Biological Selenium Treatment	Re-estimated based on revised flow for this land retirement scenario (37 cfs)	Re-estimated based on revised flow for this land retirement scenario (22 cfs)	Re-estimated based on revised flow for this land retirement scenario (13 cfs)
Common Federal Costs			
Drainage Collection System	95% of original design cost	90% of original design cost	Cost of Northerly Area Only
Regional Reuse Facilities	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area

OM&R: Operation, maintenance, and replacement costs, including energy costs.

Table B-5
Assumptions Used to Determine Cost Differences for Land Retirement Scenarios, In-Valley Disposal Alternative (2002 dollars)

Project Features	40,000 Acres Retired	200,000 Acres Retired	No Drainage Provided for Westlands
FEDERAL PROJECT COSTS			
Federal Costs - Alternative Specific			
Conveyance System	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $74,164,000 Annual OM&R Cost: $761,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $64,164,000 Annual OM&R Cost: $639,000	Re-estimated based on revised flow for this land retirement scenario Construction Cost: $44,164,000 Annual OM&R Cost: $639,000
Evaporation Ponds	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $12,200/acre of evap pond Annual OM&R: $137/acre of evap pond	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $12,200/acre of evap pond Annual OM&R: $137/acre of evap pond	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $12,200/acre of evap pond Annual OM&R: $137/acre of evap pond
Wetland Mitigation Facilities	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $11,300/acre of mitigation area Annual OM&R: $100/acre of mitigation area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $11,300/acre of mitigation area Annual OM&R: $100/acre of mitigation area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $11,300/acre of mitigation area Annual OM&R: $100/acre of mitigation area
Reverse Osmosis Facilities	No change from original project design	No change from original project design	No change from original project design
Biological Selenium Treatment	Re-estimated based on revised flow for this land retirement scenario (30 cfs)	Re-estimated based on revised flow for this land retirement scenario (15.5 cfs)	Re-estimated based on revised flow for this land retirement scenario (7 cfs)
Common Federal Costs			
Drainage Collection System	95% of original design cost	90% of original design cost	Cost of Northerly Area Only
Regional Reuse Facilities	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area	Re-estimated based on revised flow for this land retirement scenario Construction Costs: $4,450/acre of reuse area Annual OM&R: $200/acre of reuse area

OM&R: Operation, maintenance, and replacement costs, including energy costs.

B3 REFERENCES

San Joaquin Valley Drainage Program (SJVDP). 1990. A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley. Final Report (AKA "The Rainbow Report"). Prepared for U.S. Department of the Interior and California Resources Agency. September.